these activities are usually lost due to the difficult nature of tracking these activities. Consequently, new techniques for incorporating these materials into a unified classroom architecture is desired.

[0034] A classroom setting can provide instructors and students with a number of devices and applications that enable the instructor to assign the students activities using these applications that can be monitored easily by the instructor. An instructor creates hand-outs to assign to the students that incorporate activities defined by contexts provided by one or more third-party applications that implement a software framework. The third-party applications are configured to track a progress of students completing activities associated with these contexts and provide progress tracking information to a background process of the device. The background process and/or a client application can interface with one or more network services designed to process the progress tracking information. The processed progress tracking information can be queried to generate report data to display to an instructor that shows a progress of each of the students assigned the hand-out.

[0035] These and other embodiments are discussed below with reference to FIGS. 1-17; however, those skilled in the art will readily appreciate that the detailed description given herein with respect to these figures is for explanatory purposes only and should not be construed as limiting.

[0036] FIG. 1 illustrates a network environment 100 designed to operate within a classroom setting, in accordance with some embodiments. The network environment 100 includes a number of separate and distinct computing devices configured to communicate over a network 150. The network environment 100 includes server devices 110 and client devices 120. As shown in FIG. 1, the client devices 120 can include, but are not limited to, laptop computers 120-1 and 120-5, tablet computers 120-2, 120-3, and 120-4, and mobile devices 120-6. It will be appreciated that the network environment 100 can include other types of client devices 120 such as desktop computers, wearable devices (e.g., smart watches), personal digital assistants, and the like.

[0037] The following terms may be used throughout this paper. A class refers to a group of individuals who meet regularly to be taught a particular subject or activity. The class can include one or more instructors and a number of students enrolled in the class. A classroom setting refers to a group of related devices utilized by a group of users associated with a class. A school refers to an administrative collection of a number of classes taught by a group of instructors. A school district refers to an organization that manages one or more schools.

[0038] In some embodiments, an instructor utilizes one or more devices to disseminate materials to students within a class. As shown in FIG. 1, the instructor can utilize a laptop computer such as client device 120-1 or a tablet computer such as client device 120-2 to create materials for the students. In some embodiments, the laptop computer and/or the tablet computer include applications configured to create interactive assignments for the students. The assignments can include links to materials available over the network 150, such as hyperlinks to websites available from a first server device 110-1 or documents stored on a second server device 110-2. The applications can also enable the instructor to easily distribute the assignments to the students. The students can utilize the tablet computers such as client

device 120-3 and 120-4, the laptop computer such as client device 120-5, and/or the mobile device such as client device 120-6 to access the assignments and view the materials included in each assignment.

[0039] In some embodiments, a third server device 110-3 hosts one or more services utilized by the applications included on the various client devices 120. For example, the third server device 110-3 can host a service for uploading data structures or files that define an assignment to a network-based storage resource. As another example, the third server device 110-3 can host a service that tracks which client devices 120 are registered to a particular classroom setting. As yet another example, the third server device 110-3 can host a service that tracks a progress of each student corresponding with a particular assignment. In some embodiments, services utilized by the application(s) can be hosted on more than one server device 110. In addition, the services can be hosted by different service providers. For example, a first server device 110—maintained by a first service provider can be configured to host a network-based storage service, and a second server device 110-2 maintained by a second service provider can be configured to host a school management service.

[0040] A description of a software framework for applications executed by the various client devices 120 within the classroom setting is set forth below. In addition, a description of various services utilized by the applications described herein and hosted on one or more server device 110 is set forth below.

[0041] FIG. 2 illustrates a client-server architecture 200 implemented to enable progress tracking for client devices 120 in the classroom setting, in accordance with some embodiments. The client-server architecture 200 includes a client application 205 implemented on a client device 120 and configured to interact with a number of services implemented on server devices 110 accessible over the network 150. The client-server architecture 200 enables instructors to create assignments that include rich interactive materials provided by one or more third-party applications installed on the client device 120 as well as integrate seamless tracking of progress such that an instructor can monitor the students' effort at keeping abreast of the assignments in a class.

[0042] In some embodiments, the client application 205 is a binary executable configured to be executed by a processor included in the client device 120. The binary executable can be designed to work within a particular operating environment, such as a target hardware platform designed to execute a target operating system. Consequently, the client application 205 can be implemented using multiple versions of the source code compiled for different operating environments. For example, a first version of the client application 205 can be designed for a laptop computer 120-1 and a second version of the client application 205 can be designed for a tablet computer 120-2.

[0043] In some embodiments, the client application 205 is designed to connect with one or more services over the network 150. The services can include, but are not limited to, a hand-out service 220, a hand-in service 230, a school management service 240, a progress pipeline 250, an identity service 260, and a report service 270. The client application 205 can be configured to access a service via an application programming interface (API) implemented by the service. For example, a web-based service can implement an API using a simple object access protocol (SOAP)